REMARKS

Claims 1-34 are pending in the present Application. Claims 8-26 and 34, which are directed to a non-elected invention, are canceled.

Claims 1 and 27 have been amended to recite a seed layer thickness of 50 to 1500 angstroms. This is supported by the Specification at page 2, lines 3-4.

Claims 1-4, 6, 7, 27-30, 32 and 33 have been rejected under 35 USC § 103(a) as being unpatentable over Chen (US 6,277,263) in combination with Rapoport et al. (US 5,298,687). Applicant respectfully traverses.

The Chen patent is directed to a method of depositing copper, particularly a method of enhancing a copper seed layer using a metal plating bath, more specifically an alkaline copper electroplating bath. See column 5, lines 11-13. This patent clearly teaches that an ultra thin seed layer can be used if it is combined with a subsequent *electrochemical* seed layer enhancement technique. See column 6, lines 5-7. Chen only teaches enhancing a seed layer by electroplating. This teaching is clearly supported throughout the patent. For example, Chen states at column 3, lines 62-65, that ultra-thin seed layers are enhanced by "depositing additional *metal* thereon in a separate deposition step to provide an enhanced seed layer that is suitable for use in a primary metal deposition." Emphasis added. Further, at column 6, lines 36-42, Chen states "it is understood that the basic principle of the enhancement of an ultra-thin seed layer prior to the bulk deposition thereof can be applied to other *metals or alloys* that are capable of being *electroplated*." Emphasis added. It is quite clear that Chen only discloses enhancing a seed layer by electroplating a metal or metal alloy on the ultra-thin seed layer. The language at column 6, lines 5-7, discussed above, makes it quite clear that Chen requires an electrochemical technique to enhance a seed layer. Thus, nothing in the Chen patent teaches or suggests a non-electrochemical technique of enhancing a seed layer. In particular, the use of a conductive polymer to enhance a seed layer is neither taught nor suggested by Chen.

Rapoport et al. disclose a hybrid electrical connection having a crossover connection between circuit patterns on a ceramic substrate. The crossover connection in this patent is a

copper-filled or silver-filled polymer. See column 4, lines 50-54. It is the metal filling that provides the conductivity in these polymers. Nothing in this patent teaches or suggests the use of polymers that are conductive without such metal filling. The conductive polymer films of Rapoport et al. are approximately *20 μm* thick, see column 6, lines 14-16. Such a thick layer is over 100 times the thickness of Applicants' seed layer.

Applicant's invention is directed to depositing a seed layer or enhancing a discontinuous seed layer by use of a conductive polymer to provide a seed layer having a thickness of 50 to 1500 angstroms. That Applicant's conductive polymers are not metal filled is clear from the Specification at page 5, lines 3-18. The Specification clearly recites polymers that are themselves conductive. Further, such polymers can be disposed on the substrate without electroplating. See the Specification at page 5, lines 23-25, which disclose conventional methods of disposing an organic polymer on a substrate. Electrochemical techniques of disposing the conductive polymer are not disclosed.

One skilled in the art would have no motivation to combine Rapoport et al. with Chen. As described above, Chen is directed only to enhancing seed layers using an electrochemical technique and by depositing only a metal or metal alloy. No other methods are disclosed or suggested by Chen. Nothing in Chen would lead one skilled in the art to substitute a polymer for such metal or metal alloy nor to use a non-electrochemical technique to enhance a seed layer. The Rapoport patent discloses films of silver filled or copper filled polymers that are far thicker (i.e. 20 μm) than the dimensions of the apertures (i.e. ≤1 μm) used in integrated circuit manufacture. Thus, one would not look to Rapoport et al. to deposit or enhance a seed layer having a thickness of 50 to 1500 angstroms used in the manufacture of integrated circuits. Even if one did look to Rapoport, this patent only discloses metal (i.e. silver or copper) filled polymers and neither teaches nor suggests conductive polymers that are not metal filled. Nothing in these references alone or in combination discloses or suggests Applicant's claimed invention. Applicant submits that the Examiner has not made out a prima facie case of obviousness and respectfully requests that this rejection be withdrawn.

Claims 5 and 31 have been rejected under 35 USC § 103(a) as being unpatentable over Chen (US 6,277,263) in combination with Rapoport et al. (US 5,298,687) further in view of Jonas (US 6,358,437) or Cloots (US 6,340,496). Applicant respectfully traverses.

The Chen and Rapoport patents are discussed above, both individually and in combination.

Neither Jonas et al. nor Cloots et al. fill the deficiencies of Chen, Rapoport or a combination of these references. The Jonas and Cloots patents only disclose certain polymers. Nothing in these patents teach or suggest the use of such conductive polymers in the manufacture of integrated circuits. Further, nothing in these patents teach or suggest the use of such conductive polymers to deposit or repair a seed layer, particularly on a substrate having ≤ 1 μm apertures.

As discussed above, one skilled in the art would have no motivation to combine Rapoport et al. with Chen. Chen is only directed to the *electrochemical* enhancement of seed layers with a *metal or metal alloy*. The Chen patent would not lead one skilled in the art to substitute a polymer for such metal or metal alloy or to use a non-electrochemical technique of seed layer enchancement. The Rapoport patent is directed to the use of copper filled or silver filled polymers that are far thicker than the dimensions of the apertures used in integrated circuit manufacture. Nothing in Rapoport teaches or suggests the use of a conductive polymer that does not contain a metal filler. Further, nothing in this patent teaches or suggests the use of films of conductive polymer of sufficient thinness (50-1500 angstroms) to function as a seed layer or to repair a discontinuous seed layer. The Jonas and/or Cloots references add nothing to Chen and/or Rapoport. There is nothing in the Chen, Rapoport, Jonas or Cloots references, individually or in any combination that would fairly suggest Applicant's claimed invention. Applicant respectfully submits that the Examiner has not made out a prima facie case of obviousness and respectfully requests that this rejection be withdrawn.

In view of the foregoing, Applicants respectfully request favorable reconsideration in the form of a notice of allowance.

Respectfully submitted,

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